Remarks:

The above amendments and these remarks are responsive to the non-final Office action dated July 23, 2007, and are being filed under 37 C.F.R. § 1.111. Claims 1-28 were pending in the application prior to entry of the present claim amendments. In the Office action, the Examiner (1) rejected claim 23 under 35 U.S.C. § 101 for allegedly being drawn to non-statutory subject matter, (2) objected to claims 4, 15, and 17 for an alleged lack of correspondence with the specification, (3) rejected claims 1, 2, 8, and 23 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,124,940 to Heydinger ("Heydinger"), and (4) rejected claims 3-6, 9-22, and 24-28 under 35 U.S.C. § 103(a) as being unpatentable over a combination of Heydinger and one or more other references. Applicants traverse the rejections, contending that all of the pending claims are drawn to statutory subject matter, are in full agreement with the specification, and are patentable over each of the cited references, taken alone or in combination.

Nevertheless, to expedite the issuance of a patent, and to more particularly point out and distinctly claim aspects of the invention that applicants would like to patent now, applicants have (1) canceled claims 1-9, 15, and 23, without prejudice; (2) amended claims 10, 14, 16, 18, 21, 22, and 24; and (3) added new claims 29-31. However, applicants reserve the right to pursue any of the canceled or amended claims, in original or amended form, at a later time. Furthermore, applicants have presented remarks showing that claims 10-14, 16-22, and 24-31 are patentable over the cited references. In view of the amendments above, and the remarks below, applicants respectfully

request reconsideration of the application and allowance of all of the currently pending claims.

I. Claim Amendments

The present communication amends claims 10, 14, 16, 18, 21, 22, and 24, and adds new claims 29-31. Exemplary support (and/or an explanation) for each amendment and new claim is presented, without limitation, in the following table:

Claim	*Exemplary Support (and/or Explanation)*
10 (Independent)	Claims 24 and 26 (Improves clarity)
14 and 16	(Address a formal issue created by the amendment of claim 10)
16	(Improves clarity)
18 (Independent)	Claims 24 and 26 (Improves clarity)
21 (Independent)	Claims 24 and 26 (Improves clarity)
22	(Addresses a formal issue created by the amendment of claim 21)
24 (Independent)	Claim 26 (Improves clarity)
29	Claim 26
30	Claim 26
31	Claim 26

II. Rejection under 35 U.S.C. § 101

The Examiner rejected claim 23 under 35 U.S.C. § 101 for allegedly being directed to non-statutory subject matter. Applicants traverse the rejection, contending that claim 23 is directed to statutory subject matter. Nevertheless, for the reasons set forth above, applicants have canceled claim 23 without prejudice. Therefore, the rejection of claim 23 under Section 101 is moot.

III. Claim Objections

The Examiner objected to claims 4, 15, and 17 for an alleged lack of correspondence between the specification and each of these claims. In particular, the Examiner asserted that "it does not describe in the specification that the print data are already compressed." Applicants traverse the objections, contending that there is no discrepancy between the specification and the recited subject matter of claims 4, 15, and 17. Nevertheless, for the reasons set forth above, applicants have canceled claims 4 and 15, thereby rendering the objections moot for two of the three claims.

Applicants contend that claim 17 corresponds closely to the portion of the specification (page 6, lines 5-15) cited by the Examiner. Claim 17 recites "wherein removing provides a first compression, the method further comprising performing a second compression of the compressed print data before sending." In comparison, the cited section of the specification reads as follows:

> For example, compression instructions 56 may delete and/or remove the invalid portion specified by each mask, before and/or during sending the complementary valid portion to the printer [*thereby providing a first compression by removing*]. In addition, compression instructions 56 may be configured to perform additional compression of the print data [*thereby performing a second compression of the compressed print data before sending*]. Such further compression may be performed, for example, by run-length encoding and/or by any other suitable compression method.

In the reproduced section above, correspondence between the specification and the language of claim 17 is identified by newly inserted, explanatory phrases, which are

italicized and in brackets. Applicants respectfully request that the Examiner reconsider the objection to claim 17 in view of the comparison presented above.

IV. Rejections under 35 U.S.C. § 102

The Examiner rejected claims 1, 2, 8, and 23 under 35 U.S.C. § 102(b) as being anticipated by Heydinger. Applicants traverse the rejections because the cited reference does not disclose, teach, or suggest every element of any of the pending claims. Nevertheless, for the reasons set forth above, applicants have canceled claims 1, 2, 8, and 23 without prejudice. Therefore, the rejections under Section 102 should be moot.

V. Rejections under 35 U.S.C. § 103

The Examiner rejected claims 3-6, 9-22, and 24-28 under 35 U.S.C. § 103(a) as being unpatentable over Heydinger in combination with one or more other references as follows:

- Claims 4, 9, and 15 were rejected over Heydinger in view of U.S. Patent No. 7,178,078 to Hiraide et al. ("Hiraide");
- Claim 5 was rejected over Heydinger in view of U.S. Patent Application Publication No. 2003/0025751 to Otsuki ("Otsuki");
- Claim 6 was rejected over Heydinger in view of U.S. Patent No. 5,930,466 to Rademacher ("Rademacher");
- Claims 10-14, 16, and 18-20 were rejected over U.S. Patent No. 6,543,871 to Rosen et al. ("Rosen") in view of Heydinger;
- Claims 15 and 17 were rejected over Rosen in view of Heydinger and further in view of Hiraide;
- Claims 3, 21, 22, 24, 25, and 27 were rejected over Heydinger in view of Rosen; and
- Claims 26 and 28 were rejected over Heydinger in view of Rosen and further in view of U.S. Patent No. 7,102,791 to Hirano et al. ("Hirano").

Applicants traverse the rejections, contending that each of the claims is patentable over the cited references, taken alone or in combination. Nevertheless, for the reasons set forth above, applicants have amended each of the non-canceled independent claims, namely, claims 10, 18, 21, and 24. The independent claims and all of their dependent claims are patentable for at least the reasons set forth below.

A. *Claims 10–14, 16, 17, and 29*

Independent claim 10, as amended, reads as follows:

10. (Currently Amended) A method of transferring data for printing, comprising:

providing print data at a controller, the print data having a plurality of data elements specifying positions for colorant placement onto print media by a printing device;

applying a **predefined** mask to the print data **at the controller** to specify an invalid portion of the data elements;

removing the specified invalid portion of the data elements from the print data to compress the print data; and

sending intermediate data corresponding to the compressed print data to the printing device from the controller;

wherein the printing device expands the intermediate data ~~based on~~ **using a** [[the]] **copy of the** mask **stored in memory of the printing device**; and

wherein the printing device prints at least a subset of the expanded intermediate data.

In the Office action, claim 10 was rejected over Rosen in combination with Heydinger. However, neither Rosen, Heydinger, nor any of the other references cited elsewhere in the Office action, taken alone or in combination, disclose, teach, or suggest every element of claim 10. For example, none of the cited references, taken alone or in combination, discloses, teaches, or suggests applying a predefined mask to the print

data at a controller and using a copy of the mask at a printing device. Furthermore, it would not have been obvious to combine Rosen and Heydinger to achieve the claimed invention.

Heydinger relates to a method of transmitting data from a host computer to a printer. The method involves transmitting only image data having non-absolute zero values from the host computer to the printer. For example, in the method of Heydinger the image data can be divided between two scans of a printhead, with only odd-numbered bits of the image data being printed during one of the scans, and only even-numbered bits of the image data being printed during the other scan. In this example, the host computer thus can selectively transmit only the odd-numbered bits (e.g., for the first scan) and then only the even-numbered bits (e.g., for the second scan). However, Heydinger does not disclose, teach, or suggest the use of a predefined mask either by the host computer or by the printer, and thus particularly does not disclose, teach, or suggest the use of a predefined mask at a controller and the use of a copy of the mask at a printing device, as recited by claim 10. In the Office action, on page 24, lines 4–7, the Examiner admitted that Heydinger does not show the method based on a predefined mask and cited Rosen for disclosure of a predefined mask.

Rosen relates to a mask generator and image mask patterns. The mask generator may be part of or separate from a printer. The mask generator receives image data and then uses a random number selector and a constraint controller to generate a set of pseudo-random printmasks that are customized for the image data, and thus are not predefined. The printmasks are then sent to a printer, and only the

printer is disclosed to use the printmasks, to distribute the image data to two or more printing passes (i.e., scans of a printhead). Accordingly, Rosen does not disclose, teach, or suggest any use of a predefined mask and particularly not use of a predefined mask at a controller and use of a copy of the mask at a printing device.

Hiraide relates to a testing apparatus and testing method for an integrated circuit comprising shift registers. The testing apparatus is disclosed to include a mask for masking an indeterminate value in outputs from the shift registers. Hiraide does not involve printing or a printing device and thus does not disclose, teach, or suggest any manipulation of print data at a controller or at a printing device and particularly not use of a copy of a mask at a printing device.

Otsuki relates to printing with a printing apparatus capable of selectively forming varied types of ink dots. The printing apparatus is disclosed to include a plurality of mask patterns that can be selected. However, Otsuki does not disclose, teach, or suggest use of a mask at a controller and use of a copy of the mask at a printing device.

Rademacher relates to a method and apparatus for compression of bit-mapped printer data. However, the reference does not involve use of a mask.

Hirano relates to production of masks for converting multi-level (N-bit) image data into halftone (two-bit) image data. The masks of Hirano are not used to distribute image data among different passes of a printhead. Accordingly, none of the masks of Hirano specify an invalid portion of the data elements, as recited by claim 10. Furthermore, Hirano does not disclose, teach, or suggest use of a mask at a controller and use of a copy of the mask at a printing device.

It also would not have been obvious to combine Rosen and Heydinger to achieve the claimed invention. As described above, Rosen relates to generation of pseudo-random printmasks. Heydinger, in contrast, relates to dividing print data into highly ordered, non-random groups, such as a first group consisting of even-numbered bits and a second group consisting of odd-numbered bits. In addition, Heydinger relies on the regular, ordered pattern of each group of bits to guide removal and re-introduction of the bits that have values of absolute zero. Accordingly, one of skill in the art would not have combined the pseudo-random approach of Rosen with the non-random approach of Heydinger because the pseudo-random approach does not have a regular pattern to guide removal and re-introduction of absolute-zero bits.

In summary, none of the cited references, taken alone or in combination, discloses, teaches, or suggests every element of amended claim 10, and it would not have been obvious to combine Rosen and Heydinger. Claim 10 thus should be allowed. In addition, claims 11-14, 16, 17, and 29, which depend ultimately from independent claim 10, also should be allowed for at least the same reasons as claim 10.

B. *Claims 18–20 and 30*

Independent claim 18, as amended, reads as follows:

> 18. (Currently Amended) A system for transferring print data to a printing device, comprising:
>
> a controller configured to **use a predefined mask to** select a first portion of print data disposed in a first pattern and to remove a second portion of the print data disposed in a second pattern that is complementary to the first pattern so that the print data is compressed; and
>
> a printing device **including a copy of the mask stored in memory and being** configured to receive intermediate data corresponding to the compressed print data, [[and]] to expand the intermediate data **using the copy of the mask, and** ~~based on at least one of the first and second patterns, the printing device being configured further~~ to print at least a subset of the expanded intermediate data.

In the Office action, claim 18 was rejected over Rosen in combination with Heydinger. However, for the same general reasons as those presented above for claim 10, neither Rosen, Heydinger, nor any of the other references cited elsewhere in the Office action, taken alone or in combination, discloses, teaches, or suggests every element of claim 18. For example, none of the cited references, taken alone or in combination, discloses, teaches, or suggests a controller configured to use a predefined mask and a printing device including a copy of the mask stored in memory. Furthermore, for the reasons presented above in relation to claim 10, it would not have been obvious to combine Rosen and Heydinger to achieve the claimed invention. Independent claim 18 thus should be allowed. In addition, claims 19, 20, and 30, which depend ultimately from claim 18, also should be allowed for at least the same reasons as claim 18.

C. *Claims 21, 22, and 31*

Independent claim 21, as amended, reads as follows:

> 21. (Currently Amended) A printing device for printing expanded data produced from intermediate data received from a controller, the intermediate data corresponding to print data that is compressed **using a predefined mask and** by retaining a first portion of the print data disposed in a first pattern and removing a second portion of the print data disposed in a second pattern that is complementary to the first pattern, the printing device comprising:
>
> **memory storing a copy of the mask;**
>
> a processor configured to receive the intermediate data and to expand the intermediate data **using the copy of the mask and** based on at least one of the first and second patterns; and
>
> a colorant delivery mechanism coupled with the processor and configured to deliver colorant to print media according to the intermediate data after such intermediate data is expanded by the processor.

In the Office action, claim 21 was rejected over Heydinger. However, for the same general reasons as those presented above for claim 10, neither Heydinger nor any of the other references cited elsewhere in the Office action, taken alone or in combination, discloses, teaches, or suggests every element of claim 21. For example, none of the cited references, taken alone or in combination, discloses, teaches, or suggests a printing device configured to receive print data compressed with a mask by a controller and to use a copy of the mask stored in memory of the printing device to expand the compressed print data. Independent claim 21 thus should be allowed. In addition, claims 22 and 31, which depend ultimately from claim 21, also should be allowed for at least the same reasons as claim 21.

D. *Claims 24–28*

Independent claim 24, as amended, reads as follows:

> 24. (Currently Amended) A method of transmitting data to a printing device, comprising:
>
> providing a first array of M X N print data elements **to a controller**;
>
> applying a predefined mask **at the controller** to the first array so as to create a second array of M X N print data elements, the second array including a valid portion and an invalid portion; and
>
> transmitting the valid portion **selectively** to a printing device **that includes a copy of the predefined mask stored in memory of the printing device**,
>
> wherein the printing device uses **the** [[a]] copy of the predefined mask to convert the valid portion into a third array of M X N print data elements, and wherein the printing device generates printed output according to the third array of print data elements.

In the Office action, claim 24 was rejected over Heydinger and Rosen. However, for the same general reasons as those presented above for claim 10, neither Heydinger, Rosen, nor any of the other references cited elsewhere in the Office action, taken alone or in combination, discloses, teaches, or suggests every element of claim 24. For example, none of the cited references, taken alone or in combination, discloses, teaches, or suggests applying a predefined mask at the controller and a printing device that uses a copy of the predefined mask. Independent claim 24 thus should be allowed. In addition, claims 25-28, which depend from claim 24, also should be allowed for at least the same reasons as claim 24.

VI. New Claims 29–31

The present communication adds new claims 29-31, which depend respectively from independent claims 10, 18, and 21. Each of the new claims recites that the copy of the mask is stored in non-volatile memory of the printing device. Applicants submit that claims 29-31 are patentable not only for depending from allowable independent claims 10, 18, and 21, but also for further distinguishing the claimed invention from the prior art.

Support for new claims 29-31 is provided by claim 26. In the Office action, claim 26 was rejected over a combination of Heydinger, Rosen, and Hirano, with Hirano allegedly providing a teaching for storage of a mask in non-volatile memory of a printing device. Applicants contend that it would not have been obvious to combine Heydinger, Rosen, and Hirano to achieve the claimed invention. Combination of Heydinger and Rosen would not have been obvious for the reasons set forth above for claim 10. In addition, combination of Heydinger or Rosen with Hirano would not have been obvious because Heydinger and Rosen involve distributing print data to different passes, whereas Hirano involves converting multi-level print data to halftone print data. Furthermore, even if, for the sake of argument only, it would have been obvious to combine Rosen with Hirano, and applicants maintain it would not, Hirano provides no motivation for storing the customized pseudo-random printmasks of Rosen in non-volatile memory, since Rosen discloses generation of a new set of pseudo-random printmasks for each image. In other words, it would not have been obvious to store the pseudo-random printmasks of Rosen in non-volatile memory because this storage

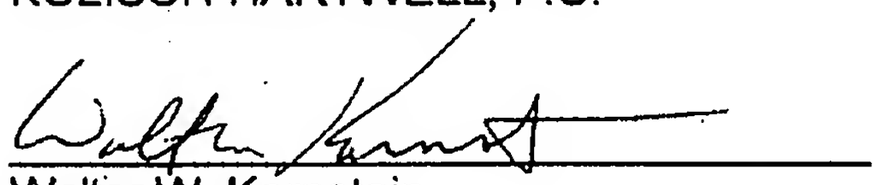
would waste non-volatile memory space on long-term storage of printmasks that are not re-used. Therefore, claims 29-31 also should be allowed for these additional reasons.

VII. Conclusion

Applicants submit that this application is now in condition for allowance, in view of the above amendments and remarks. Accordingly, applicants respectfully request that the Examiner issue a Notice of Allowance covering all of the pending claims. If the Examiner has any questions, or if a telephone interview would in any way advance prosecution of the application, please contact the undersigned attorney of record.

Respectfully submitted,

KOLISCH HARTWELL, P.C.



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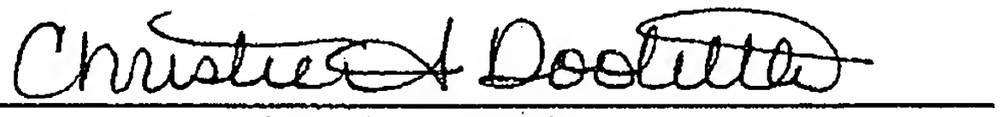
I hereby certify that this correspondence is being facsimile transmitted to Examiner A. Nguyen, Group Art Unit 2625, Assistant Commissioner for Patents, at facsimile number (571) 273-8300 on October 3, 2007.



Christie A. Doolittle